Busycon perversum Linne; and three specimens of *Neptunea stonei* Pilsbry, varying from less than three-quarters of an inch to two and a half inches in length. The largest of these *Neptunea stonei* shells, an extinct species, is one of the best-preserved specimens I have seen.

EFFECT OF SOIL MOISTURE AND ALGAE ON THE SURVIVAL OF A POND SNAIL DURING PERIODS OF RELATIVE DRYNESS

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The fate of aquatic snails in temporary prairie ponds during the dry summer months is a problem which few investigators have considered. Pilsbry (1896) records the observation that two dozen out of fifty *Lymnea bulimoides* Lea were still alive after having been out of water for 45 days. Cooke (1913) mentions that several aquatic snails will bury themselves in mud during periods of drought. Baker (1914) has observed that some species of aquatic snails may survive periods when ponds are dry, whereas in other species the adults die and only the eggs which are buried in the mud survive. Barlow (1933) has reported that certain species of Egyptian snails, which are involved in the spread of schistosomiasis, can survive drying for periods of 30 to 50 days. Van Cleave (1931) notes that the great drought of 1930 reduced land snails to 1 per cent of their usual numbers, and killed many pond and lake animals which were left in the dried out aquatic habitats.

During the course of an ecological survey of a temporary pond in Orland Park Township of Cook County, Illinois, I encountered a dense population of *Gyraulus parvus* (Say), which apparently is able to withstand long periods of drought.

This pond was completely dry from the first of August to the 11th of November, except for short periods following heavy rain storms. The algae (*Zygnema*, *Oedogonium*, and others) in the pond had formed a dry dense mat over the soil in the dried out pond, but the soil (Table 1) underneath this dry algal mat was very moist and exhibited a moisture gradient from the edge (Station A) to the deepest point in the pond (Station E).

TABLE 1

Station	No. in 10 cm. square			Per cent moisture in soil (Based on dry wt.)
	Total	Alive	Per cent alive	
A, near shore	51	11	21.6%	44.8%
B, on bottom flats	88	79	89.8	58.9
C, on bottom flats	66	56	84.9	.....
D, on bottom flats	71	64	90.4	.....
E, in deepest hole	142	122	86.0	113.9
Average	83.6	66.4		

All of the *Gyraulus parvus* found in an area 10 cm. square underneath the protective algal mat were collected, counted, and put into water to determine the number living. The result of quantitative collections on September 30 (*i.e.*, 60 days after drying out) in various regions on the dry pond bottom is shown in Table 1. Station A, which was near the shore and had been dry for the longest period of time (66 days), had the driest soil, the smallest population density (11 snails per 10 cm. square) and the smallest per cent (21.6%) of living snails. The greatest population density (122 living snails per 10 cm. square) was found in the deepest place in the pond where the soil moisture was the greatest. The high per cent of soil moisture in Station E was due to this area drying out last, and to the nearness of the surface of the soil to the water table, which was only six inches beneath the surface. Evidently, the algal mat and the soil moisture provide an environment which is favorable to the survival of many of these snails during periods of drought, when these aquatic snails aestivate. Less moist areas near shore are not as favorable for survival, as indicated by the percentage of dead snails.

That the greater number of snails were found in that part of the pond which became dry last is to be expected, as removal of the water tends to concentrate the population. Using the 5 quadrats which were taken at random on various parts of the pond bottom to compute the average number of living snails per unit area, we find an average of 66 individuals per 10 cm. square area, or 6600 per square meter, or 26,710,200 per acre of pond floor. Before the pond became dry, this number was undoubtedly

even greater. The great population density of this small snail indicates that *Gyraulus parvus* plays not an insignificant role in the community of this pond. The ability of this snail to survive during periods of drought is probably augumented by the protective action of a dense dry algal mat which is left on the pond bottom when the pond dries out.

The results of this study demonstrate that *Gyraulus parvus* produces a dense population in this temporary prairie pond; that a high percentage of these snails can survive long periods of drought; that the algae in the pond form a protective mat on the bottom of the pond when it dries out; and that the great amount of moisture in the soil of the dried pond and the protective algal mat provides a favorable environment for the survival of these snails.

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SOME HAPLOTREMATIDAE

BY H. BURRINGTON BAKER

Since 1930 (Proc. A.N.S.P., 82: 307), Drs. W. O. Gregg and G. D. Hanna have kindly sent me the animals of 3 additional species of *Haplotrema* from California, and 2 of *Austroselenites* have been collected in Puerto Rico. In plate 9, the small numbers at the end of each scale indicate their lengths in mm. or fractions. Those abbreviated labels, which are not explained in the text, are defined in Bull. Bishop Museum 158: 92–93 (1938).

Incidentally, in 1930, I retained the term "entocone" for the